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REPORT
ON THE
P O L Y Z O A
OF THE
QUEEN CHARLOTTE ISLANDS.

BY
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[Plates XIX. & XX.]

IN 1878 Dr. G. M. Dawson conducted an exploration of the Queen Charlotte Islands, as one of the staff of the Geological Survey of Canada. The results of his expedition are embodied in a valuable report which appears in the official "Report of Progress" for the year 1878-79*.

A series of dredgings formed a part of the plan of operations; and large quantities of material were obtained at various points off the coasts. Mr. J. F. Whiteaves has reported on the Echinodermata, the principal portions of the Mollusca, and some other Invertebrate tribes. The Crustacea have been dealt with by Prof. S. I. Smith, of Yale College. The Polyzoa and Hydroida have been placed in my hands for examination; and to the former the present Report is devoted.

The Queen Charlotte Islands are situated in the North

* 'Geological Survey of Canada, Report of Progress for 1878-9: published by authority of Parliament, Montreal, 1880.'

Pacific, and "form a compact archipelago, separated by wide waterways from the islands which fringe the shore of the mainland of British Columbia to the west, and the coast of the southern extremity of Alaska to the north." They are "included in north latitude between $54^{\circ} 15'$ and $51^{\circ} 55'$, in west longitude between $131^{\circ} 2'$ and $133^{\circ} 5'$. The extreme length from point to point is 156 miles, the greatest width, in a direction at right angles to the length, 52 miles" (*Dawson*).

The average temperature of the surface-water in the neighbourhood of the islands was determined by frequent observations to be $53^{\circ}.8$ F. for the summer months (June to August inclusive). Fifteen observations taken between September 12th and October 17th gave a mean of $50^{\circ}.7$ F.

The dredgings which have been placed in my hands were taken chiefly at three or four stations—one at the extreme north of the islands, and the rest off the south-eastern portions of the coast.

I shall reserve all remarks on the facies of the Polyzoan fauna of the islands and its relation to the general subject of distribution for the close of the Report. The number of undescribed species is large, including some very striking and interesting forms; but so far no new generic type has occurred. The beauty and the luxuriant growth of the specimens are remarkable; the old shells taken up are thickly incrustated by splendid masses of the different species, each valve usually presenting a rich variety of forms. The fauna, so far as the Polyzoa are concerned, points to very favourable climatic conditions.

List of Species.

Subkingdom MOLLUSCA.

Class POLYZOA, J. V. Thompson.

Subclass HOLOBRANCHIA, Lankester.

Group *Ectoprocta*, Nitsche.

Order GYMNOLEMMATA, Allman.

Suborder CHEILOSTOMATA, Busk.

Family Aeteidae.

AETEA, Lamouroux.

Aetea ligulata, Busk.

Houston Stewart Channel; off Cumshewa Harbour; Dolo-

mite Narrows*. [Coast of Patagonia; Straits of Magellan (*Darwin*); Victoria.]

Family Eucratiidæ.

GEMELLARIA, Savigny.

Gemellaria loricata, Linnæus.

Virago Sound †, 8-15 fms.

Family Cellulariidæ.

MENIPEA, Lamouroux.

Menipea ternata, Ellis & Solander.

Virago Sound.

Menipea ternata, form with many cells in an internode.

Cellularia ternata, forma *gracilis*, Smitt.

Menipea gracilis, Busk.

Off Cumshewa Harbour. [Spitzbergen (*Smitt*); Franklin-Pierce Bay (*Feilden*, *N. Polar Exp.*); Barents Sea (*Dutch Arctic Exp.*).]

Menipea compacta, n. sp., form *triplex*.

Zoæcia in triplets, the two lower cells elongate, enlarged above and tapering off below, the upper one much shorter; area oval, occupying about half the length of the cell; margin raised and thin, four spines on the outer side and two on the inner, with a horn-coloured base, some of them stout and pod-like; operculum slender, simple, acicular, placed on the inner side very close to the bottom of the area. *Lateral avicularia* variable in size, sometimes very large, borne on the two lower cells; *anterior avicularia* wanting. *Oæcium* terminal, rounded, expanded above, smooth and punctured. *Internodes* very short and compact, somewhat wedge-shaped; connecting tubes double.

Loc. On weed, Queen Charlotte Islands.

I am not acquainted with any described species to which the present form can be referred; it belongs to the section of the genus which is so characteristic of the Australian seas. A *Menipea* (apparently undescribed) occurs abundantly in California, and has also been found off Vancouver Island, to which

* These stations are all on the eastern coast, Houston Stewart Channel being only a short distance from the extreme southern point of the islands.

† This is the most northerly station at which dredgings were obtained.

M. compacta bears a very close resemblance in the details of its structure, and with which it is probably identical, though the Californian form has more cells in the internode, and is furnished with a more fully developed operculum. A distinctive feature of the species is the position of the operculum, very close to the lower extremity of the area.

SCRUPOCELLARIA, Van Beneden.

Scrupocellaria varians, n. sp. (Pl. XIX. figs. 1-1 c.)

Zoarium much branched dichotomously, forming a shrubby tuft. *Zoecia* biserial, alternate, elongate, enlarged above, tapering off downwards; area about half, or sometimes more than half, the length of the cell, oval, margin thin and smooth, three spines on the outer side above and one on the inner; the portion of the cell below the area tapering, smooth; operculum small, usually trifold. *Lateral avicularium* either small and of normal shape (mandible pointed), or more commonly much elongated upwards, in the direction of the line of zoecia, extending a considerable way above the top of the cell to which it is attached, consisting of a long channelled beak (free through a great part of its length), terminating above in two spinous points, and a slender setiform mandible, bent at the apex, with an expanded triangular base, which, when at rest, falls into the groove traversing the beak; usually at the bottom of the area a prominent sessile *avicularium* with pointed mandible. *Vibraculum* cell wedge-shaped, the terminal groove stretching transversely across the back of the cell; seta rather long and very slender. *Oecium* subglobular, smooth and shining.

Height of the tuft $\frac{1}{2}$ an inch.

Loc. Off Cumshewa Harbour, growing on shell.

The remarkable point in the present species is the curious modification of the lateral avicularium. In form and structure the avicularian appendages are, as a rule, more constant in this and the kindred genera than in most other sections of the Polyzoa. I know of no deviation from the ordinary type except in the present case and in a species (which I hope shortly to describe) which is furnished with an elongate, subspatulate avicularium, very unlike the normal form of the appendage in this tribe.

In *S. varians* both the ordinary and the modified form of the avicularium occur on the same specimens; the two are intermingled, but the latter is much the more abundant. I venture to think that we have here additional evidence of a

very striking kind, of that instability of the avicularian structure, upon which I have often insisted.

Apart from its avicularium, *S. varians* presents no very striking features; and, of course, the variability in this organ would not in itself constitute a specific distinction. In other respects, however, it is, I believe, sufficiently distinct from the various described forms.

Scrupocellaria brevisetis, n. sp.

Zoæcia biserial, alternate, elongate, tapering downward, surface smooth and glossy; area oval, about half the length of the cell or less, set somewhat obliquely, surrounded by a rather broad smooth border; three spines on the outer side above, and one or two on the inner; operculum small, placed about the middle of the inner side, when mature entire or with a slightly irregular margin, narrow towards the base, expanding above it, surface smooth. *Lateral avicularium* sometimes gigantic and much swollen below, sometimes very small, with a triangular mandible somewhat bent at the apex; the beak strongly hooked. *Vibracular cell* placed just above the lateral avicularium, rounded and somewhat contracted below, expanding very slightly upward, truncate above, a constriction about the middle, immediately below which is the orifice from which the radical fibre springs, the terminal groove straight or slightly oblique, stretching across the back of the cell; seta very short, about twice the length of the groove. *Oæcium* (?). *Zoarium* of a stout habit; internodes moderately long (7-10 cells).

Loc. Houston Stewart Channel.

This species bears some resemblance to *S. scrupea*, but is at once distinguishable from it by the differences in the vibraculum.

CABEREA, Lamouroux.

Caberea Ellisii, Fleming.

Off Cumshewa Harbour. [Vancouver Island (*Dawson*); Labrador and Maine, Greenland, Iceland, Scandinavia and Finmark, Britain (North), Brittany.]

Family *Bicellariidæ*.

BUGULA, Oken.

Bugula avicularia, Linnæus.

Houston Stewart Channel, 8-20 fms.; Virago Sound, 8-15 fms. [Spitzbergen, Britain, Adriatic, Australia.]

Bugula Murrayana (normal), Johnston.

Houston Stewart Channel, in shell; Virago Sound. [Vancouver Island (*Dawson*); Britain (chiefly north), Scandinavia, Spitzbergen, Barents Sea, Greenland, Labrador, Gulf of St. Lawrence, New England.]

Family Cellariidæ.

CELLARIA, Lamouroux (part.).

Cellaria borealis, Busk.

Virago Sound. Off Cumshewa Harbour; Houston Stewart Channel. Abundant and very fine. [West Greenland, 6-10 fms.]

The internodes in this fine and characteristic species expand regularly from the base upward, and are often of very considerable width above. The specimens from the Queen Charlotte Islands are in some cases very large, attaining a height of more than $2\frac{1}{2}$ inches.

Cellaria mandibulata, n. sp.

Zoarium slender, irregularly branched; the internodes attenuated at the base, joints black. *Zoecia* contiguous in the same line, bluntly pointed or rounded above, the margin trending outwards to about the middle, and from this point slanting inwards to the base, truncate below (lozenge-shaped); area slightly depressed, smooth, margin distinct, subcrenulate; orifice semicircular, situated in the upper third of the area, lower lip arched. *Avicularian cells* in the line of the ordinary zoecia, which they resemble, but are shorter and very much broader (about twice the width), prominent above, almost the whole of the upper portion (more than a third of the length) occupied by a semicircular orifice, which is filled in by a stout mandibular plate of a very dark horn-colour, the edge black. *Oœcial opening* at the very top of the cell, and of much the same shape as the orifice.

Loc. Houston Stewart Channel; Virago Sound.

C. mandibulata bears a close resemblance in most respects to *C. fistulosa*, and is separated from it on the strength of the very marked differences in the avicularium, which is found to be the best criterion for distinguishing specific forms in this genus. The avicularium of the latter is (morphologically) a dwarfed cell, with the oral valve slightly modified. In the present species the avicularian cell is in some respects larger than the ordinary zoecium, from which it is distinguished chiefly by its great breadth, its prominence, and its ample,

dark-coloured, semicircular mandible (or modified oral valve). It represents one of the earliest stages in the developmental history of this appendage*.

It may be a question, perhaps, whether *C. mandibulata* should not be regarded as a "form" of *C. fistulosa*; but it has much the same kind of claim to specific rank as *C. sinuosa*. After all, these systematic distinctions are only meant to mark the developmental steps.

Family **Membraniporidae**.

Group *a* (*FLUSTRIDÆ*).

FLUSTRA, Linnæus.

Flustra membranaceo-truncata, Smitt.

Virago Sound, 8-15 fms. [North Sea, Arctic Seas, common.]

Group *b*.

MEMBRANIPORA, De Blainville.

Membranipora unicornis, Fleming.

Houston Stewart Channel, 8-20 fms.; very fine. [Spitzbergen, Greenland, Nova Zembla, Labrador, Britain (north-east).]

Membranipora Rosselii, Audouin.

Houston Stewart Channel, on shells, not uncommon. [Britain, Algiers, Adriatic.]

Membranipora tenuirostris, Hincks.

Off Cumshewa Harbour; Houston Stewart Channel. [Mediterranean; Madeira.]

Membranipora horrida, Hincks.

Houston Stewart Channel, 8-10 fms.; off Cumshewa Harbour. Abundant and very fine, forming very large, reddish-brown patches on shells. [California; Vancouver Island.]

Membranipora patula, Hincks.

Virago Sound; Houston Stewart Channel, &c., very common and of luxuriant growth. [California.]

* We have a very similar form in *Cellaria hirsuta*, MacGillivray, and *Membranipora longicornis*, mihi. See 'History of British Marine Polyzoa,' Introduction, p. lxviii, fig. xxx.

The oœcium was not observed on Californian specimens, but is present in profusion on those from the Queen Charlotte Islands. It is shallow, cucullate, smooth, and closed in front by a chitinous operculum. The species forms brown or reddish-brown patches.

Membranipora variegata, Hincks.

Dolomite Narrows, in about 8 fms., very plentiful; spreading in large patches over the surface of shells. [California.]

Specimens occur in which there are two of the pedicellate avicularia at opposite sides of the cell, instead of the normal one. The spines are without the dark-coloured base, which is a conspicuous feature in the Californian form.

Membranipora acifera, MacGillivray, form *multispinata*.
(Pl. XIX. fig. 4.)

The form from the Queen Charlotte Islands which I refer to MacGillivray's species differs in some respects from his description; but the two agree so perfectly in the most striking and important characters that there is hardly room for doubt as to their identity. He describes his *M. acifera* as having "one or two sharp incurved spines on each side, and usually a small round spine in each upper angle." In the North Pacific specimens, which are finely developed, there are two erect and pointed spines at the top of the cell, and along each side six or seven rather tall, straight, acuminate spines, which slope inwards without meeting. The spines are at best a somewhat variable character; and the single specimen which MacGillivray examined can hardly be accepted as fixing the normal armature of his species. The general character and the remarkable avicularium are the same in both forms.

Virago Sound. [Victoria (*MacGillivray*).]

Membranipora echinus, n. sp. (Pl. XIX. fig. 5.)

Zoœcia quincuncial, oval, distinct, separated by rather deep and wide interspaces; front wall wholly membranous; two spines at the top and from seven to eight slender, closely set, pointed, and rather tall spines down each side, which slant inwards but barely meet in the centre; on each side, springing from behind the second spine from the top, a pedicellate avicularium, the upper part large and much swollen (closely resembling a "bird's head"), very slightly hooked at the extremity, borne on a very thin pedicle; mandible slender, pointed. *Oœcium* (?).

Loc. Houston Stewart Channel; Cumshewa, 20 fms.

A very marked characteristic of this species (which belongs to the *M. spinifera* section) is the distinctness of the zoecia, which lie so much apart from one another that the whole cell to its very base is visible, the wall flanging outward slightly below. It is very common amongst the dredgings.

Membranipora exilis, n. sp. (Pl. XX. fig. 1.)

Zoecia very regularly quincuncial, oblong, slightly enlarged about the middle, subtruncate above and below, set closely together, of considerable size and delicate half membranaceous material; margin thin, a good deal raised, the front wall wholly membranous; at the top of the cell two pointed spines, and (usually) two on one side and three on the other situated in the upper half of the cell, slender, acuminate, erect, jointed to a tubular base; a sessile *avicularium* on the margin at one side (often wanting) just below the top; beak much swollen below, inclined upwards, scarcely bent at the extremity; mandible blunt, directed downwards. *Oæcium* (?).

Loc. Houston Stewart Channel, enveloping *Cellariaborealis*, Busk, with a very thin crust.

Membranipora Sophieæ, Busk, form *matura*.
(Pl. XX. fig. 2.)

Zoecia oval, quincuncial, set very closely together; front wall wholly membranous; margin thin, smooth, on each side from four to six sharply pointed spines, which bend rather abruptly over the area and meet in the middle; an *avicularium* at each side on the margin, just below the upper end, slightly raised, pointed, the mandible directed upwards, a small erect spine at the base of each *avicularium*; at the bottom of the cell a single *avicularium*, with an elongate triangular mandible, variously turned (sometimes two). *Oæcium* rounded, smooth, with a rib arching across the front, frequently carried up into a peak.

Loc. Houston Stewart Channel. [Assistance Bay; Spitzbergen.]

Described as *M. conferta* ('Annals' for September 1882). I am now convinced that it is a form of *M. Sophieæ*. Smitt notices intermediate varieties.

Membranipora nigrans, n. sp. (Pl. XIX. figs. 2, 2 a.)

Zoecia large, ovate (variable in shape, sometimes arched above and narrowing downwards, sometimes broad-ovate, sometimes oval), irregularly disposed; margins much elevated, crenate, the whole front of the cell covered by a rather

coarse stout membrane of a black colour; oral valve large; on each side at the top a pointed *avicularium*, placed on the margin, depressed at the base, the beak sloping upwards, mandible directed obliquely downwards; very large *avicularia*, slightly raised in front, with a broad triangular mandible, which is bent abruptly in the middle, scattered amongst the zoecia. *Oecium* very shallow, just covering the extremity of the cell, smooth, with a raised rib across it a little above the oral margin. *Zoarium* of a deep black colour, forming large irregularly spreading crusts.

Loc. Houston Stewart Channel; Virago Sound.

A fine characteristic species, distinguished by its dark colour and its remarkably large zoecia.

Membranipora levata, n. sp. (Pl. XIX. figs. 6, 6 a.)

Zoecia small, oval, distinct, quincuncial; margin very slightly raised, thin, delicately crenate, the whole front closed in by a smooth light-coloured and rather glossy membrane, which lies very much on a level with the edge of the cell; above each zoecium, on a somewhat quadrate area, a small nodule with a pointed *avicularium* on one side of it, the mandible directed transversely upward. *Oecium* rounded, smooth, umbonate.

Loc. Houston Stewart Channel, 15-20 fms; Cumshewa; very abundant.

Membranipora protecta, n. sp. (Pl. XIX. fig. 3.)

Zoecia contracted above, expanded below, disposed rather irregularly in lines, set closely together, front wall wholly membranous; margin thickened, minutely granulous; two erect spines (sometimes bifid) at the top; below them on each side a single bifid spine, and below these two large, branched, antler-like spines, which meet over the aperture; numerous *avicularia* interspersed amongst the cells, placed on a distinct area, beak elongate, slanting upwards, traversed by a narrow groove, mandible with a triangular base, the upper portion long, slender, setiform. *Oecium* (?).

Loc. Virago Sound; Cumshewa, on shell.

Other species, armed with more or less branching spines, are:—*M. cornigera*, Busk, from Shetland; *M. bellula*, Hincks, Australia, &c.; *M. cervicornis*, Busk, Victoria; and *M. cervicornis*, Haswell*, Queensland, in which the antler-like pro-

* This name cannot of course be retained, having been previously employed by Busk. I venture to suggest as a substitute for it *M. Haswellii*, in recognition of the services of one of the earnest workers who are doing so much for Australian natural history.

cesses are described as arising from "one side of the cell." This species is also furnished with a strong vibraculoid spine below the area, and seems to be destitute of avicularia. The present form is certainly distinct from all the above.

Membranipora corniculifera, n. sp. (Pl. XX. figs. 4, 4 a.)

Zoecia ovate, much narrowed towards the oral extremity, expanded below, distinct; margin rather thick, granulated; area occupying the whole of the front of the cell, with a membranous covering; from six to nine tall, stout, erect spines round the upper part of the cell; below them about four on each side, bent inward over the area, of which the uppermost pair are the stoutest, the rest being extremely slender and acuminate; two or three very long and much attenuated spinous processes springing from the wall of the cell at the top, behind the marginal spines; oral valve large, filling the narrow neck-like extremity of the cell above; on the outer surface of the side wall, a little below the top, a minute *avicularium* (Pl. XX. fig. 4 a), with a pointed mandible directed outwards. *Oaecium* small, rounded, smooth, with a horn-like process projecting from the centre of the oral margin.

Loc. Cumshewa, on shell.

This species is remarkable for its wonderful array of spines. The position of the *avicularium* on the outer surface of the cell below the margin is also peculiar.

Membranipora minuscula, n. sp. (Pl. XX. figs. 3, 3 a.)

Zoecia small, oval, arranged in quincunx (somewhat irregularly); margin a good deal raised, thin, smooth, no spines; on an oblong area, placed above the cell, occasionally a small circular *avicularium*, slightly raised, the mandible directed upwards. *Oaecium* semicircular, shallow, just covering the extremity of the cell, smooth, with a subcircular membranous space at the back (? *avicularian*). *Zoarium* forming a thin flat crust, usually of small size.

Loc. Houston Stewart Channel, &c., common.

Membranipora membranacea, Linnæus.

Queen Charlotte Islands, incrusting the stem of a sea-weed.

The only specimen that occurs is covered with numerous tall, very stout, membranous processes, which occupy the place of one of the spires at the top of the *zoecium*. They are smooth and glossy, narrow at the base, somewhat enlarged about the middle, and taper off to a point above. They are no doubt modified spines; but we have no clue to their his-

tory. They must not be confounded with the processes on the so-called "tower-cells," which originate on the membranous front wall of the zoecium; both are probably abnormal growths with no special function.

[Norway, Britain, Brittany, Adriatic; New Zealand, Australia.]

Membranipora membranacea, form *serrata*.

Zoecia rectangular-oblong, greatly elongated; margins smooth; at the top of the cell, on each side, a short blunt spine; round the inner margin a narrow crenated border.

Loc. Virago Sound, spreading over the surface of a seaweed.

This is a remarkably pretty variety, and presents a very distinctive appearance. The cells are of unusual length, and exhibit great regularity both of form and arrangement. But the character which distinguishes it most and gives it a very marked individuality is the narrow crenate edging which fringes the inner margin of the cell. The crenulations are small and close-set and for the most part regular; here and there longer spinous processes rise amongst them and project over the area. One of these is always placed in the centre of the lower margin of the cell.

Family **Microporidæ**.

MICROPORA, Gray.

Micropora coriacea, Esper, var.

The form in which the marginal nodules are wanting is extremely abundant amongst the dredgings. It is, indeed, one of the commonest species, covering many of the shells with its flat glossy crust, and seldom altogether absent from any.

[Bass's Straits, Australia, var.; Britain, Florida, with the nodules.]

Family **Cribrilinidæ**.

CRIBRILINA, Gray.

Cribrilina furcata, n. sp. (Pl. XX. fig. 5.)

Zoecia ovate, quincuncial, very regularly disposed, moderately convex; surface smooth and lustrous, often of a reddish brown colour; on each side from four to six shallow grooves, radiating to a median line, and a central one below, which are occupied by a row of roundish pores set very closely together,

Fig.

Fig.

Fig.

the ridges between them slightly raised, usually bearing several elliptical pores; orifice arched above, straight below, much broader than high, on each side a stout bifid spine (occasionally simple); peristome much thickened in front and rising into a central mucro. *Avicularia* none. *Oæcium* large (covering about half the cell above it), rounded, taller than broad, depressed in front, with a shallow oral arch; surface smooth, rather thickly punctured, the forked spines showing in front of it.

Loc. Cumshewa; Houston Stewart Channel; common.

The furcate spine is often wanting, especially in the older cells.

Cribrilina hippocrepis, n. sp. (Pl. XX. figs. 6, 6 a.)

Zoæcia ovate, quincuncial; surface lustrous, flattish (sutures very shallow), traversed by radiating ridges (from three to five on each side), which pass from the sides to the centre (no median keel), the grooves between them occupied by a line of rather large oblong pores; at the origin of each ridge an elliptical foramen, covered in by a delicate membrane; orifice large, well arched above, constricted a little above the lower margin, which is straight; operculum of a rich reddish brown; peristome not elevated, lower margin much thickened, usually terminating on each side in a knob; large, elongate, depressed spatulate avicularia scattered amongst the cells. *Oæcium* (?).

Surface of *zoarium* very flat; colour brown, with a tinge of red; in old states white and highly calcified.

Primary cell ovate, area occupying about three fourths of the front surface, with a membranous covering; margin slightly thickened; about fourteen spines surrounding the area, which originate outside and a little below the margin.

Loc. Cumshewa; Houston Stewart Channel; abundant.

The primary cell is interesting as giving a clue to the genetic history of the species and of the Cribriline form generally. There can be little doubt that the ridges which constitute the chief framework of the front wall in the adult are modifications of the spines, which are preserved in the early condition of the cell.

EXPLANATION OF THE PLATES.

PLATE XIX.

Fig. 1. Scrupocellaria varians, n. sp., nat. size. 1 a. *Zoæcia*, magnified.
1 b. Dorsal surface. 1 c. *Avicularia*.

Fig. 2. Membranipora nigrans. 2 a. Large avicularium.

Fig. 3. Membranipora protecta, n. sp.

Fig. 4. *Membranipora acifera*, MacGillivray, form *multispinata*.

Fig. 5. *Membranipora echinus*, n. sp.

Fig. 6. *Membranipora levata*, n. sp. 6 a. Oecium.

PLATE XX.

Fig. 1. *Membranipora exilis*, n. sp.

Fig. 2. *Membranipora Sophiae*, Busk, form *matura*.

Fig. 3. *Membranipora minuscula*, n. sp. 3 a. Avicularian area.

Fig. 4. *Membranipora corniculifera*, n. sp. 4 a. Zoecium with ovicell, showing the horn-like projection on the latter.

Fig. 5. *Cribrilina furcata*, n. sp.

Fig. 6. *Cribrilina hippocrepis*, n. sp. 6 a. Primary cell.

[Plates XVII. & XVIII.]

Family Cribrilinidæ (continued).

CRIBRILINA, Gray.

Cribrilina radiata, Moll.

Form *innominata*: off Cumshewa; Houston Stewart Channel.

Form *with vibraculoid setæ*, not uncommon.

[Britain, chiefly south and south-west coasts; France (south-west), Mediterranean, Madeira, Gulf of Florida.]

Some beautiful varieties of this variable species occur: the form which bears vibraculoid setæ is especially remarkable for richness of sculpture and delicacy of structure; it is furnished with a distinct (though minute) lunate pore, placed within the triangular space below the mouth. This character therefore is not distinctive as between the genera *Microporella* and *Cribrilina*, though it is always present in the former and very exceptionally in the latter. Smitt unites these genera in one family (Eschariporidæ*); but the very peculiar structure of the cell-wall in *Cribrilina* seems to entitle it to stand as the type of a separate group.

Family Microporellidæ.

MICROPORELLA, Hincks.

Microporella ciliata, Pallas.

Normal and forms *Californica* (Busk), *vibraculifera* and *umbonata*, mihi.

* 'Floridan Bryozoa,' part i. p. 21.

[Normal: Arctic and northern seas; Britain, France (south-west), Mediterranean, Florida, Zanzibar, Australia, New Zealand, &c. Var. *Californica*, California.]

Microporella ciliata, form *vibraculifera* *, n.
(Pl. XVII. fig. 2.)

Avicularium replaced by a very tall membrano-chitinous vibraculoid process, situated on a rather large mound or swelling, the beak elevated at the sides and somewhat deeply notched or channelled at the extremity.

This is in many respects the most remarkable form which Dr. Dawson's dredgings have yielded. It occurs abundantly and in company with the normal *M. ciliata* and several interesting varieties.

I have already discussed (in the paper referred to) the curious morphological change which the avicularian organ has undergone in this variety, and its significance as illustrating the relation between the two appendages (*avicularium* and *vibraculum*). The mandible of the *avicularium* is frequently slightly elongated, and projects a little beyond the anterior extremity of the beak. In the present variety this elongation has been carried very much further, and at the same time a narrow chitinous expansion seems to have been developed along each edge of the setiform process thus formed. In this way a tall vibraculoid organ has taken the place of the normal mandible. The beak survives; but it too has undergone a certain amount of modification, tending to secure freer play for the movable seta. In general character the present variety agrees entirely with the ordinary forms of *M. ciliata*.

A glance at the three varieties represented on Pl. XVII. (figs. 1, 2, 3) will suffice to show what an amount of superficial difference there may be within the limits of one and the same species, and may well suggest those structural elements which should have most significance with the systematist, as indications of genetic affinity.

Microporella ciliata, form *umbonata*, n. (Pl. XVII. fig. 1.)

An umbonate process placed on each side of the orifice. Below the inferior margin a massive mamillary rising, which, when fully developed, conceals the pore. The entire surface thickly covered with rather large punctures, which are sometimes arranged in radiating lines.

Loc. Dolomite Narrows, on stone.

* See a paper by the author "On certain remarkable Modifications of the *Avicularium* in a Species of *Polyzoon*; and on the Relation of the *Vibraculum* to the *Avicularium*" ('Annals' for January 1882, p. 20).

Microporella ciliata, form *Californica*. (Pl. XVII. fig. 3.)

Lepralia californica, Busk, Quart. Journ. Micr. Sc. iv. (1856) p. 310, pl. xi. fig. 6.

This variety is abundant amongst the dredgings. The oecium is sometimes very prettily adorned with ribs radiating from a central boss towards the base.

Microporella Malusii, Audouin.

Extremely abundant and very fine; one of the commonest species.

MONOPORELLA, Hincks.

Monoporella brunnea, n. sp. (Pl. XVIII. fig. 4.)

Zoecia ovate or sometimes lozenge-shaped, quincuncial, moderately convex, separated by fine lines, sutures well defined; surface glistening, minutely granulated, punctured and reticulate, the punctures often more or less obliterated by the calcification; orifice arched above, lower margin straight or slightly curved inward, peristome not raised; the cell-wall elevated below the mouth, so as to inclose a small cavity or chamber, within which is placed a slightly raised circular *avicularium*. *Oecium* (?). *Zoarium* forming a light brownish crust.

In this species the surface glistens as if varnished. The cells are well defined and simple in structure. In the older zoecia the punctures disappear beneath the calcification, the reticulations showing faintly through the stony crust.

Family Myriozoidæ (part.), Smitt.

SCHIZOPORELLA, Hincks.

Schizoporella auriculata, Hassall, form *ochracea*, Hincks.
(Plate XVIII. fig. 5.)

Off Cumshewa. [Britain, coast of Cornwall.]

I have not noticed the normal form of this species; but the variety which I have named *ochracea*, and which is characterized by the presence of an immersed oval *avicularium* on the front of the cell a short distance below the mouth, is not uncommon.

In the specimens from the Queen Charlotte Islands there is almost always a small nodule immediately below the *avicularium*, which is wanting in the British form.

Schizoporella Cecillii, Audouin.

Incrusting a *Cellepora*; a single specimen.

[Mediterranean, Australia, Britain (south-west), Channel Islands.]

Schizoporella hyalina, Linnæus.

Very abundant.

[Arctic seas, Britain, California, Africa, Australia, New Zealand, Falkland Islands, &c.]

Schizoporella sanguinea, Norman.

On shell, a single specimen of great beauty. Avicularia are altogether wanting.

[Britain (south-west), Mediterranean, Madeira, Florida.]

Schizoporella biaperta, Michelin.

Houston Stewart Channel; Virago Sound. On shell and stone.

[Britain (south), Arctic seas, Mediterranean, Madeira, Florida (deep water), Bass's Straits.]

The surface in the younger cells is thickly covered with minute punctures, which are more or less obliterated as calcification proceeds. A rounded avicularium is present on both sides of the orifice, and the large mamillated form with pointed mandible is also abundant.

Schizoporella sinuosa, Busk.

Shallow water, on shell.

[Scotland (west), and Shetland, Arctic seas, Gulf of St. Lawrence.]

Highly calcified, the oœcia being deeply immersed.

Schizoporella crassilabris, n. sp. (Pl. XVIII. fig. 1.)

Zoœcia large, elongate, ovate, quincuncial, very distinct, convex; surface dense, punctured (the punctures often obliterated by the calcification); orifice suberect, suborbicular, with a broad, rounded, shallow sinus occupying nearly the whole of the lower margin; peristome raised and thickened, forming a wall round the orifice, often massive in front, where it is carried out into a broad projection, notched or sinuated in the centre. *Avicularia* none. *Oœcium* large, rounded, broader than high, with rather large punctures.

Houston Stewart Channel, 15-20 fathoms, on small shells.

Schizoporella crassirostris, n. sp. (Pl. XVIII. fig. 3.)

Zoecia ovate, quincuncially arranged, very convex, much elevated (gibbous) towards the oral region; surface dense, traversed by raised lines or ribs, radiating towards the sides; immediately below the orifice a tall and massive rostrum which occupies a large part of the front of the cell; on the inner side of it towards the base an avicularium placed transversely, mandible pointed, beak sharp and curved at the extremity; below the rostrum a smooth area, extending to the bottom of the cell, arched above, and marked off by a distinct line; orifice orbicular, with a shallow rounded sinus on the lower margin, occupying about two thirds of its width, peristome raised in the older cells; frequently a pointed *avicularium*, placed on the margin of the orifice and attached to one side of the rostrum. *Oecium* (?).

On stone, a single specimen.

A very peculiar form, of which the striking feature is the large rostrum, which appears all the larger from the elevation of the cell-wall below the orifice. The defined area, with smooth surface below the rostrum, is no doubt the site of the *oecium*, which was not developed in the specimen examined.

Schizoporella longirostrata, n. sp. (Pl. XVII. fig. 4.)

Zoecia large, ovate, disposed in lines, moderately convex (sutures shallow); surface roughened or minutely granulated, covered with an epitheca; orifice arched above, lower margin extended into a wide, rounded, and shallow sinus, which occupies about three fourths of the width; peristome thin, sometimes elevated at each side; on one side of the cell, generally a little below the orifice, an elongate pointed *avicularium*, the mandible (which is broad at the base and tapering above) directed obliquely downwards, usually turned slightly outwards. *Oecium* rounded, depressed in front, thickly punctured, with a shallow oral arch.

Off Cumsheva, on shell.

A curious diversity in the shape of the orifice occurs in this species. It is commonly as described in the diagnosis; but interspersed amongst the normal *zoecia* are others in which the orifice is of a narrow elongate form, the sinus being deep and pointed, and less distinctly marked off from the rest of the oral opening than in the other case. The shape of the mouth in these cells is very regularly obovate. When covered with its epitheca this species is of a uniform light brown colour, and the granulose sculpture is almost concealed.

Schizoporella insculpta, n. sp. (Pl. XVII. fig. 5.)

Zoarium foliaceous and bilaminar, or incrusting. *Zoecia* large, ovate, or narrow-oblong (often much elongated), quincuncial, depressed, separated by raised lines, sutures shallow; surface vitreous, glossy, thickly covered over its whole extent with punctures; orifice arched above, the lower margin almost entirely occupied by a wide, very shallow sinus; peristome thin, moderately raised, extended in front (beyond the sinus) so as to form a small chamber, in which is a rounded orifice (? avicularian). *Oecia* profusely developed, very large (covering about two thirds of the cell above), elongate, rounded above, with a tall oral arch, thickly covered with slight granulated ridges, which radiate from the opening to the base, sometimes punctured round the base.

Virago Sound, attached to stems, from which it rises in free foliaceous expansions; Cumshewa Harbour. [Vancouver Is.]

The oecium is sometimes extended at the top into a disk-bearing process, by which it is attached to the cell above (Pl. XVII. fig. 5 a).

Schizoporella tumulosa, n. sp. (Pl. XVIII. fig. 2.)

Zoecia quincuncial, very regularly arranged, very convex, ovate, much elevated centrally below the mouth, the wall sloping steeply down to the margin of the cell; surface dense, smooth, rather glossy, areolated round the edge, ridges radiating towards the centre; orifice orbicular, with a small central sinus, not contracted at the opening; peristome not elevated; immediately below the orifice, at one side of the sinus, a rostrum bearing on one side a pointed *avicularium*, the beak very slightly bent at the extremity, mandible directed upwards, the rostrum rising into a short mucronate point behind the avicularium; very commonly on the front of the cell, near the bottom, a much-raised *avicularium* (mounted on a prominent elevation) with a pointed mandible directed straight outwards. *Oecium* rounded, smooth, much broader than high, with a tall oral arch filled in by a calcareous plate.

Off Cumshewa, in 20 fathoms, forming a brownish spreading crust.

Schizoporella pristina, n. sp. (Pl. XVII. fig. 6.)

Zoecia ovate, irregularly disposed and shaped, moderately convex, separated by raised lines; surface thickly punctured, presenting (in older states) a reticulated appearance; orifice rounded above, the lower margin curving out below the opercular denticles into a wide rounded sinus, so that the mouth

appears almost circular, peristome not raised, sometimes a thickened granulous border surrounding the orifice in front. *Avicularia* none. *Oæcium* (?)

Dolomite Narrows, on shell.

The oral sinus in this species takes its origin immediately below the denticles on which the opercular valve works, and is somewhat difficult to recognize. At first sight the orifice seems to be circular, as the sinus occupies nearly the whole of the inferior margin. The lower cell in the figure (Pl. XVII. fig. 6), which is represented with the operculum *in situ*, is defective in not showing the contraction below the denticles.

We have here, we may suppose, one of the primitive forms of the sinuated orifice, from which others may have been derived by contraction (more or less) or other modification of the marginal curve. The suboral pore of certain genera probably owes its origin to the isolation of the most specialized form of sinus, a central notch with contracted aperture.

Schizoporella maculosa, n. sp.

Zoæcia quincuncial, rather small, moderately convex, sutures shallow; surface shining, covered with small punctures, which are closed in by a brownish membrane, and give a spotted appearance to the front wall; orifice arched above, with a shallow bluntly pointed sinus below, not contracted at the opening, peristome slightly thickened; on one side, just below the orifice (or occasionally on both sides), a small rounded *avicularium* on a prominent boss. *Oæcium* (?)

On shell.

The specimens of this form have unfortunately been mislaid; but I hope to be able to give a figure of it in a subsequent portion of the Report.

Schizoporella Dawsoni, n. sp.

Zoæcia ovate, or hexagonal, quincuncial, depressed or very moderately convex, separated by raised lines, highly calcified, vitreous; surface reticulato-punctate (punctures appearing as deep shafts in the vitreous crust); orifice arched above, much broader than high (narrow between the upper and inferior margins), a shallow rounded sinus in the centre of the lower margin, not contracted at the opening; peristome not raised, thickened round the sinus. *Avicularia* none. *Oæcium* rounded, closely united to the cell above, somewhat depressed in front, glossy, covered with rather large punctures; a prominent thickened border round the opening.

Virago Sound, on shell.

SCHIZOTHECA, Hincks.

*Schizotheca fissurella**, n. sp. (Pl. XVII. fig. 7.)

Zoecia small, quincuncially disposed, ovate, the lower portion flattish, the oral region raised, tubular, suberect; sometimes punctured round the margin, sutures extremely shallow; surface smooth, porcellaneous, shining; orifice immersed, arched above, straight below, with a narrow slit-like sinus; (?) two spines on the upper margin; peristome thickened and elevated round the mouth, so as to form a kind of neck, carried out in front into a projection, which is notched in the centre and bimucronate; on each side a sharp spinous process, often wanting. *Oecium* rounded, smooth, with a small longitudinal fissure above the opening, and a central tooth-like process just within the oral arch.

Dolomite Narrows; Cumshewa, &c.; not uncommon on shells and stone.

This is a very characteristic member of the genus *Schizotheca*, of which only two species have hitherto been recorded—*S. fissa*, Busk (Britain and Mediterranean), and *S. divisa*, Norman (Britain). I have only noticed obscure traces of marginal spines, which constitute a very striking character in the British forms.

HIPPOTHOA, Lamouroux.

Hippothoa expansa, Dawson.

Common on shells; Houston Stewart Channel. [Shetland, Gulf of St. Lawrence, Davis Straits.]

Hippothoa distans, MacGillivray.

Cumshewa; Houston Stewart Channel. [Britain, Mediterranean, Singapore, Australia.]

MYRIOZOOM, Donati.

Myriozoom coarctatum, Sars.

Cumshewa; Houston Stewart Channel, 15–20 fms.; abundant and fine. [Vancouver Island, Campbell Island (British Columbia), Arctic seas, Norway.]

* Described as a *Schizoporella*, 'Annals' for September 1882, p. 253.

Family **Escharidae** (part.), Smitt.**LEPRALIA** (part.), Johnston.*Lepralia nitescens*, n. sp. (Pl. XVIII. fig. 6.)

Zoecia quincuncial, short-ovate, very ventricose; surface dense, vitreous, highly polished and glistening, smooth, with obscure radiating ridges, punctured, sometimes areolated round the margin; orifice much higher than broad, immersed in the older cells, arched above, slightly contracted a short way above the lower margin, which is a little curved outward; peristome not raised, the inner edge of the oral aperture finely denticulate, 3 or 4 spines above; on each side, in a line with the lower margin, a strong nodulous process; about the centre of the margin an *avicularium*, with rounded mandible, placed on a swelling, which extends some way down the cell, and facing sideways, mandible directed upwards; often on the front of the cell near the bottom (towards one side) a bracket-like projection, bearing a rounded *avicularium*. *Oecium* (?).

Zoarium forming a brownish patch on shells.

Houston Stewart Channel; Cumshewa; Virago Sound (probably).

EXPLANATION OF THE PLATES.

PLATE XVII.

- Fig. 1. *Microporella ciliata*, Pallas, form *umbonata*, Hincks.
 Fig. 2. *Microporella ciliata*, Pallas, form *vibraculifera*, Hincks.
 Fig. 3. *Microporella ciliata*, Pallas, form *Californica*, Busk.
 Fig. 4. *Schizoporella longirostrata*, n. sp.
 Fig. 5. *Schizoporella insculpta*, n. sp. 5 a. *Oecium*.
 Fig. 6. *Schizoporella pristina*, n. sp.
 Fig. 7. *Schizotheca fissurella*, n. sp. 7 a. A *zoecium* showing the primary orifice.

PLATE XVIII.

- Fig. 1. *Schizoporella crassilabris*, n. sp.
 Fig. 2. *Schizoporella tumulosa*, n. sp. 2 a. *Oecium*. 2 b. Orifice of marginal cell.
 Fig. 3. *Schizoporella crassirostris*, n. sp.
 Fig. 4. *Monoporella brunnea*, n. sp. 4 a. *Zoecium* showing the suboral *avicularium*.
 Fig. 5. *Schizoporella auriculata*, Hassall, form *ochracea*.
 Fig. 6. *Lepralia nitescens*, n. sp. 6 a. A young *zoecium*.
 [A figure of *Schizoporella Dawsoni* will be given hereafter.]

[Plates III. & IV.]

LEPRALIA (part.), Johnston.

Lepralia bilabiata, n. sp. (Pl. III. fig. 1.)

Zoecia quincuncially arranged, short, very slightly convex, the sutures little more than incised lines, rounded above (where the cell-wall forms a distinct border round the orifice), widening out at each side, and narrowing off towards the base, which is subtruncate or pointed; surface dense, smooth, of a somewhat waxy appearance and a dark brown colour; orifice large, occupying nearly half of the front surface, rounded above, slightly contracted a short distance above the lower margin, which is arched outwards; peristome unarmed, not elevated; operculum smooth, of a deep black colour, with a slight rim round the edge, the inner surface attached to a bilabiate tubular passage (Pl. III. fig. 1 b), through which the polypide issues. *Avicularia* none. *Oæcium* a subtriangular extension of the cell above the orifice, very little raised, a great part of its front surface occupied by a large foramen, closed in by membrano-chitinous material (Pl. III. fig. 1 a).

Zoarium of a very dark brown colour (almost black).

Houston-Stewart Channel, on shells.

When the zoecium is open, the orifice is occupied in great part by the entrance to a tubular passage, through which the polypide issues; this entrance is bilabiate, the lower lip consisting of a semicircular chitinous rim, as it were soldered to the inner surface of the operculum; the upper or opposed lip, also chitinous, is movable, and closes upon the opercular lip when the polypide retreats.

The structure of the ovicell in this species is peculiar; it consists of a short extension of the cell upwards, the front wall of which is much depressed, and bears a large foramen, with a chitinous lid or covering. The oecial chamber is small, and the entrance to it is closed by the operculum of the cell. This is a very distinct modification of the ordinary form of oecium.

L. bilabiata is luxuriant in growth, and forms very large spreading crusts.

Lepralia claviculata, n. sp. (Pl. III. fig. 2.)

Zoecia ovate or lozenge-shaped (sometimes irregular in shape and size), regularly quincuncial, depressed; surface glossy, thickly covered with minute circular punctures, which

give it a pretty speckled appearance; orifice arched and expanded above, more or less narrowed downwards, contracted by a small acute projection on each side just above the lower margin, which is distinctly curved; peristome not raised. *Avicularia* keyhole-shaped, placed on a distinct area, very much smaller than that of the cell, sometimes immediately above a zoecium, more commonly in the angle between two zoecia; mandible directed upwards. *Oæcium* (fig. 2 a) very large, higher than broad, depressed towards the opening, and often grooved longitudinally above the oral arch rising above into a kind of central knob (but on the whole not much elevated), white, glossy, thickly punctured.

Zoarium forming large, spreading, whitish crusts.

Houston-Stewart Channel; Cumshewa, 20 fms.

Cases occur in which the avicularium is situated on an area almost as large as that of the cells, just below the upper extremity, occupying, in fact, the position of the oral aperture. Occasionally two of these appendages occur together, either placed one above the other or side by side.

PORELLA, Gray.

Porella concinna, Busk.

Cumshewa, on shell.

[Britain, Adriatic, Finmark, Norway, Spitzbergen, Franz-Josef Land (*Ridley*), Greenland, Gulf of St. Lawrence, Bass's Straits.]

A beautiful variety occurs in which the whole surface of the cell, except the umbo below the orifice, is covered with rather large punctures; the orifice is ample, and its characteristic features are very distinctly marked. The zoarium is white, and delicate in texture.

Porella marsupium, MacGillivray, form *porifera*.

(Pl. IV. fig. 4.)

This species, which is a common Australian form, occurs abundantly amongst the dredgings. The specimens from the Queen Charlotte Islands differ from those which I have examined from Bass's Straits in one or two points, but they are quite unimportant. On the front of the suboral swelling, which supports the avicularium, are two (or occasionally three) rather large circular pores, placed side by side. They give a somewhat peculiar appearance to the cell, but do not seem to have any special significance. Frequently too there is a small raised oval avicularium on the front of the cell, besides

the oral avicularium, which I have not noticed on Australian specimens. The cell-wall is smooth and entire; the oecium is traversed by delicate radiating lines.

Extremely common, on shells &c.

[Victoria (*MacGillivray*); Bass's Straits (*Capt. Cawne Warren*).]

The species described by Mr. Ridley from the Straits of Magellan (*Proc. Zool. Soc. Jan. 4, 1881*) as *Schizoporella marsupium*, and identified by him with MacGillivray's *Lepralia marsupium*, is, I have no doubt, the *Escharina simplex* of D'Orbigny ('Voyage dans l'Amérique Mérid.'), obtained from "les Îles Malouines." MacGillivray, who has found this species in Victoria, has named it *Schizoporella Ridleyi* (*Proc. Roy. Soc. Victoria, Oct. 12, 1882*).

We have no alternative, however, but to revert to the earlier designation, and it must stand as *Schizoporella simplex*, D'Orb.

Porella major, n. sp. (Pl. IV. fig. 5.)

Zowcia ovate or (sometimes) hexagonal, somewhat elongate, quincuncial, rather depressed, sutures shallow, often with a line of punctures round the margin; surface smooth or slightly roughened, glossy; orifice arched above, lower margin curved inwards, so as almost to appear dentate; peristome thin, unarmed, elevated (in the adult cell), especially above, immediately below the orifice a narrow avicularian swelling, stretching across the front of the cell and bearing in the centre a small oval *avicularium*, mandible directed downwards. *Oecium* rounded, moderately prominent, surface minutely roughened, the peristome forming a raised rim round the oral arch.

Zoarium of a very light brownish colour.

Cumshewa; Houston-Stewart Channel, common on shells.

SMITTIA, Hincks.

Smittia trispinosa, Johnston.

Houston-Stewart Channel; off Cumshewa; Virago Sound: abundant.

[Britain, Norway, Arctic regions, St. Lawrence, Mingan Islands, Florida, Mazatlan, Cape Horn, Aden, Adriatic, East Indies (*Dr. Anderson*), Bass's Straits.]

Several varieties occur. As a rule, the avicularian appendages are present in great profusion and of unusual size.

Smittia plicata, Smitt.

Houston-Stewart Channel; off Cumshewa, 20 fms.: not uncommon.

[Spitzbergen, Greenland, 100 fms., Godhavn Harbour, Disco.]

The form which I refer to Smitt's *Cellepora plicata* differs slightly from the description and figures given by that author; but in essential particulars, I believe, it agrees with them. In the specimens from the Queen Charlotte Islands the avicularium is well within the peristome, and there is little if any trace of the umbo, on which, according to Smitt, it is placed in his *C. plicata*. This, however, may be due to the greater development of the peristome, by which the umbo may have been to a large extent concealed. The cells are often invested by a membranous epitheca.

Smittia spathulifera, n. sp. (Pl. IV. fig. 3.)

Zoecia large, ovate, quincuncially arranged, very moderately convex, bordered by delicate raised lines; surface covered with rather large round punctures, which, however, are in great measure concealed by the stout epitheca that clothes the zoarium; orifice arched above, lower margin straight and within it a large bifid tooth; peristome much raised (especially above) forming an elongate secondary orifice, produced below into a spout-like sinus, which is occupied by a spatulate *avicularium*; mandible directed downwards. *Oecium* large, immersed, closely united to the cell above; surface roughened, punctured round the edge. *Zoarium* forming a brownish crust.

Houston-Stewart Channel.

MUCRONELLA, Hincks.

Mucronella ventricosa, Hassall.

Virago Sound, in about 20 fms., on shells.

[Britain, France (S.W.), Mediterranean, New Zealand, Bergen, Greenland, Nova Zembla, Kara Sea.]

Mucronella pavonella, Alder.

Virago Sound.

[St. Lawrence, Greenland, Nova Zembla, Spitzbergen, Finmark, off Jutland, Britain (north-east).]

Mucronella prælucida, n. sp. (Pl. IV. fig. 1.)

Zoecia large, ovate, quincuncial, slightly convex, separated by raised lines; surface thickly covered with roundish punctures, lustrous; orifice arched above, lower margin straight

(without denticles), peristome raised, especially at the back and in front, where it rises in the centre into a blunt mucronate projection, which bends slightly inwards; the surface of the peristome smooth, entire, and very glossy. *Avicularia* none. *Oœcium* (?).

Houston-Stewart Channel, not uncommon on shells.

Mucronella prælonga, n. sp. (Pl. IV. fig. 2.)

Zoœcia long and (usually) slender, quincuncially disposed, somewhat wider above than at the base (elongate-ovate, sometimes appearing almost subtubular), convex, depressed below, rising towards the oral extremity; surface thickly covered with minute punctures, shining (the glistening appearance due to the presence of an epitheca); orifice suborbicular, peristome elevated round it, carried out in front into a very prominent process, often much thrown back and greatly elongated, sometimes simply pointed, sometimes bi- or trimucronate, on the inner side of it near the base a single, small, sharply-pointed denticle; the upper margin produced in the centre into a tall spinous process, broad at the base, attenuated and membrano-calcareous above. *Avicularia* none. *Oœcium* (?). *Zoarium* forming a whitish subcircular crust.

Houston-Stewart Channel, on shell.

A very picturesque form, distinguished by the remarkable processes on the upper and inferior margins of the peristome. The mucro in front is sometimes very greatly elongated, and, in such cases, the upper portion seems to be formed of very delicate membrano-calcareous material. The spinous extension of the peristome on the upper margin, which is much attenuated above, is also made up, to a great extent, of similar material. The subtubular character of the zoœcia is a striking feature, though occasionally, and especially near the growing edge of the colony, they assume a more distinctly ovate form.

Mucronella spinosissima, Hincks, form *major*.
(Pl. III. fig. 3.)

Zoœcia broad-ovate, short, arranged in quincunx, very convex, sutures deep, surface smooth, subhyaline in the younger cells, opaque in the older, a number of slender tubules immersed in the cell-wall immediately beneath the surface, and radiating from the margin towards the centre, the aperture opening out apparently on the surface, but closed by a calcareous diaphragm; the oral extremity of the cell much raised, contracted, suberect, forming a neck which bears the orifice; orifice suborbicular, a small mucronate projection in

the centre of the lower margin, the rest of the peristome occupied by 6-10 tubular spinous processes, a denticle within the peristome on the lower primary margin. *Avicularia* none. *Oæcium* (fig. 3*b*) rounded, developed behind the neck-like peristome (the orifice, with its full armature of spines, rising before it), sometimes traversed by a number of the immersed tubules. *Primary cell* (fig. 3*a*) small, ovate; aperture occupying about two thirds of the front surface, surrounded by a raised border, which bears about 8-10 spines; the orifice nearly semicircular, occupying the upper portion of the aperture, the lower part closed in by a delicate membrano-calcareous covering; portion of the cell below the aperture smooth and solid.

Zoarium forming very large cream-coloured crusts on shells.

Extremely abundant; probably the commonest species amongst Dr. Dawson's dredgings.

[Bass's Straits (*Capt. Cawne Warren*).]

I have ranked this interesting form as a variety of *M. spinosissima*, a species which I have described and figured in my report on the Polyzoa of Bass's Straits ('Annals' for Aug. 1881). In all the principal elements of structure there is an exact correspondence between the two; but there are also one or two differences, which materially affect the general appearance, and, at the first glance, few probably would be likely to identify them. In the present variety the cells are very much larger than those of the Australian form. The latter are small and delicate, while those of the variety *major* are ample, broadly ovate, massive, and strongly built. But the chief difference between them lies in the system of tubules, more or less immersed in the cell-wall and showing as white striæ on the glossy surface, which gives so distinctive a character to the North-Pacific form. Of this tubular structure I have been unable to detect any trace in the Australian specimens which I have examined. Possibly the condition of the stony crust may be such as to conceal it; but this hardly seems probable, as in the finest colony which has come under my notice calcification has evidently not proceeded far. It may also be noted that the cells of the Australian variety have well-marked row of punctures round the margin.

At present, looking to the close structural agreement between the two forms, and in the absence of any precise knowledge as to the development and function of the tubules, I prefer to include them in one specific group.

The tubules appear as delicate white lines through the subhyaline crust, radiating from the circumference towards the centre of the zoecium. They vary much in length, some being almost rudimentary, and others extending nearly or

quite to the centre of the cell. Not unfrequently short tubes alternate with the longer ones; and commonly the latter seem to be composed of several short tubules, which originate one from the other, a little below and behind the orifice. In the younger zoœcia the tubules are, I believe, *on the surface*; but they are soon overgrown by the calcareous crust, and in older states they are completely concealed by it. In highly calcified colonies this feature disappears, and the cells present a uniform opaque surface. It is difficult to form a conjecture as to the precise import of the tubular system, and the more so as there has been no opportunity thus far of tracing the growth of the cell-wall and the mode in which the tubules originate.

The numerous oral spines seem to be developed round the primary orifice, and are inclosed by the wall of the secondary orifice, above which they project.

The primary cell of *Mucronella spinosissima* closely resembles that of *M. Peachii*. [See note on page 42.]

RETEPORA, Imperato.

Retepora Wallichiana, Hincks.

Houston-Stewart Channel, 15-20 fms.

[Spitzbergen, 20-80 fms., Finmark, Godhaab, 150 fms.]

This form was first described by Smitt * as a variety of *R. notopachys*, Busk, a Crag fossil. Some years later the examination of specimens obtained by Dr. Wallich in Davis Straits convinced me that it was a distinct species, and it was accordingly described as such ('Annals' for Jan. 1877, p. 107), with the name which Mr. Busk had already assigned to it in MS.

R. Wallichiana, when fully developed, forms intricate convoluted and chambered masses of considerable size. It is one of the many arctic species which have migrated to the Queen Charlotte Islands.

Family Celleporidæ.

CELLEPORA (part.), Fabricius.

Cellepora incrassata, Lamarck.

Houston-Stewart Channel; Virago Sound, incrusting the stems of Hydrozoa.

[Finmark, Spitzbergen, Greenland, Banks of Newfoundland.]

* "Kritisk förteckn. öfver Skandinavien's Hafs-Bryozoa," *Æfvers. Kongl. Vetensk. Akad. Förhandl.* 1867, Bihang.

Cellepora, ? sp.

Zoarium incrusting, of a rather dark brown colour. *Zoæcia* (towards the centre of the colony) erect, crowded, barrel-shaped, some elevated, some immersed; surface smooth, more or less punctured round the margin; orifice arched above, lower margin slightly curved outwards (suborbicular), and having in the centre a small notch, rounded below and contracted at the opening by two minute denticular projections; operculum arched above, straight and entire below; peristome raised in front, embracing a short and stout rostrum, placed immediately below the oral notch, and bearing an *avicularium* on one side close to the top, with rounded mandible directed upwards; two very tall articulated marginal spines, placed one on each side of the orifice above. Large *avicularia* scattered amongst the cells with a broad subspatulate mandible, the beak elevated at the extremity into a hood-like projection, not denticulate. *Oæcium* (?).

Incrusting Retepora and shells.

I cannot identify this form with any of the described species known to me; but I am by no means prepared at present to say that it is new to science. It does not appear (so far as I can judge in the absence of the figures) to be included amongst the 'Challenger' *Celleporæ* characterized by Busk (Journ. Linn. Soc. vol. xv. 1881, p. 341, &c.). If it should prove to be (as I suspect) undescribed, I should propose for it the name of *Cellepora brunnea*.

ADDITIONAL.

Family Porinidæ.

LAGENIPORA, Hincks.

This genus, as originally constituted*, was formed for a Porinidan species in which the cells are more or less immersed in a calcareous crust. But I am now convinced that this character cannot properly be made the foundation of a generic group, and I propose to apply the name to such forms as possess a lageniform cell with a free orbicular orifice and are destitute of a special pore. The original type of the genus, *L. socialis* mihi, will hold a place in the reconstituted group, along with *Phylactella lucida* mihi, a Madeiran species (see

* 'Annals' for September 1877; 'Hist. Brit. Marine Polyzoa,' vol. i. p. 235.

'Annals' for July 1880), and a kindred form from the Queen Charlotte Islands, which I shall now describe.

Lagenipora spinulosa, n. sp. (Pl. III. fig. 4.)

Zoecia lageniform, rather irregularly disposed, the lower portion adherent, ovate, thickly covered with punctures (sometimes almost obliterated, when the surface appears roughened or subgranulous); the oral extremity free, tubular, much produced, suberect, the surface perfectly smooth and subhyaline, slightly expanded upwards; orifice terminal, suborbicular, the front margin plain or trimucronate, and more or less elevated above the rest, somewhat everted, on each side a raised process bearing a small *avicularium* of the *Scrupocellaria* type, with minute pointed mandible directed outwards, on the upper (or hinder) margin several spinous processes. *Oaecium* small, rounded, smooth, placed far down at the back of the tubular portion of the cell.

Zoarium forming small lobate patches.

On *Tubulipora* (especially) and shells; not uncommon.

This form is nearly related to *L. lucida*, mihi, but is, I have no doubt, distinct. There is a marked difference between the *avicularia* of the two species. In *L. spinulosa* there are two, one on each side of the orifice, resembling very closely the form which is characteristic of the genus *Scrupocellaria*. In *L. lucida* there is only a single minute, oval *avicularium*, which is borne on a stout process, in the centre of the lower margin. *L. spinulosa* is altogether stouter in habit than the Madeiran species, and in the normal state the adherent portion of the cell is thickly punctured, whereas it is entire and smooth and subhyaline in the latter. It differs from *L. lucida* in another point. On each side of the free tubular portion of the cell there is a very distinct line, running the whole length of it, which seems to mark the junction between the front piece and the rest of the tube. The strongly marked groove at the base of the neck-like extension in *L. lucida* is wanting in the present form, which is also characterized by a peculiar habit of growth.

Microporella Malusii, Audouin.

A variety of this species occurs, in which there is a very prominent umbo below the pore.

Schizoporella biaperta, Michelin.

In a variety of this widely distributed species from the

Queen Charlotte Islands the lateral avicularia have a pointed mandible instead of the normal rounded one. Smitt has noticed the same thing in Floridan specimens.

EXPLANATION OF THE PLATES.

PLATE III.

- Fig. 1. Lepralia bilabiata*, n. sp. 1 *a.* Zoecium with ovicell. 1 *b.* Zoecium with the operculum thrown back, showing the entrance to the tubular passage.
Fig. 2. Lepralia claviculata, n. sp. 2 *a.* Oecium.
Fig. 3. Mucronella spinosissima, Hincks, form *major*; group of cells, showing the tubules in the front wall. 3 *a.* Primary cell. 3 *b.* Zoecium, showing the position of the ovicell behind the tubular orifice.
Fig. 4. Lagenipora spinulosa, n. sp.

PLATE IV.

- Fig. 1. Mucronella præhucida*, n. sp.
Fig. 2. Mucronella prælonga, n. sp.
Fig. 3. Smittia spathulifera, n. sp.
Fig. 4. Porella marsupium, MacGillivray, form *porifera*.
Fig. 5. Porella major, n. sp.

[Plate IX.]

Suborder CYCLOSTOMATA.

Family Crisiidæ.

CRISIA (part.), Lamouroux.

Crisia cornuta, Linnæus.

Houston-Stewart Channel; Virago Sound; common.
 [Norway, Britain, Brittany, Mediterranean.]

Crisia eburnea, Linnæus.

Virago Sound.

[North and Arctic Seas, St. Lawrence, Labrador, St. George's Banks, California, Fiji Islands, New Zealand and Australia, Madeira, Mediterranean, Britain.]

Crisia denticulata, Lamarck.

Houston-Stewart Channel.

[Kara Sea, Norway, Spitzbergen, Grand Manan, Britain, Adriatic, Madeira, South Africa.]

Family *Tubuliporidae*.

STOMATOPORA, Bronn.

Stomatopora major, Johnston.

On shell, rare.

[Bergen, Britain, Brittany.]

Stomatopora diastoporides, Norman.

On shell.

[Entrance of Baffin's Bay, Gulf of St. Lawrence, Britain.]

Stomatopora incrassata, Smitt.

A specimen occurs exhibiting the anastomosing habit which is characteristic of British examples of this species.

Cumshewa; Houston-Stewart Channel.

[Spitzbergen, Nova Zembla, Kara Sea, Britain.]

TUBULIPORA, Lamarck.

Tubulipora lobulata, Hassall.

Houston-Stewart Channel, on shell.

[Scandinavian coasts, Britain.]

Tubulipora perfragilis, n. sp.

Zoarium adnate, white, and composed of very delicate material, consisting of a short stem, widening upwards, which divides dichotomously into two principal branches, these again subdividing dichotomously, the lower segments curving downwards so as almost to surround the point of origin and the stem, and giving to the whole colony a flabellate form; branches slender at the base, expanding upwards, thickly covered with the cells, occasionally a second expansion originating from the summit of the first, to which it is connected by a narrow base. *Zoecia* crowded on the branches, radiately disposed, very slender, with a speckled surface, a large portion of the length free and subhorizontal, sometimes con-

nate and in companies of 2-4, sometimes single and detached ; orifice orbicular, unarmed. *Gonocyst* an irregular inflation of the surface of the branch, minutely punctate.

On shell.

This form has some points of resemblance to *Tubulipora capitata*, mihi ('Annals' for August 1881, "Contributions towards a General History of the Marine Polyzoa"), an Australian species ; but there are differences in the habit of growth and in some of the details of structure which probably entitle it to a distinct name. The present species is exceedingly delicate and of most graceful form. The branches seem to be slightly attached and are commonly free towards the extremities ; the tubes are remarkably slender, and the free portions are horizontally inclined rather than erect. *T. perfragilis* bears much resemblance to D'Orbigny's figure of his *Idmonea cenomana* (Pal. Franç., Terr. Crétacés, vol. v. Atlas, pl. 633. fig. 2).

Tubulipora Dawsoni, n. sp. (Pl. IX. fig. 5.)

Zoarium forming a spreading, irregularly shaped, intricate, coral-like mass, composed of many branches, much divided and subdivided dichotomously, which radiate from the point of origin and anastomose freely ; branches massive, of considerable width, somewhat compressed, flattened in front, expanding upwards, bifid or trifid at the extremities (which are cellular), recumbent or suberect, never adnate, but attached by numerous calcareous offsets from the dorsal surface to the shell or stone on which the colony grows. *Zoecia* arranged (in part) in transverse rows (two to five in each), which slant slightly downwards, connate, with a large suborbicular orifice, increasing in height from the inner side outwards, so as to give a serrated appearance to the edge of the branch ; the rows sometimes extending to the centre of the branch, but not separated by any distinct mesial line, sometimes (and more commonly) ranging along the sides, the centre being occupied by many detached cells irregularly distributed, with a suborbicular orifice, which is usually scarcely raised above the surface ; walls thickly and minutely punctate ; the dorsal surface rounded, lineated longitudinally, punctate, often with transverse furrows.

Common amongst the dredgings ; on shells and stones.

In this fine species the disposition of the cells connately in transverse rows is very much confined to the sides of the branch, and a striking characteristic is the crowd of scattered cells which very commonly fills the centre. The latter are

generally very slightly raised above the surface of the zoarium. The rows vary in length and occasionally extend to the centre of the branch; but usually the condition is as I have described it. The zoecia composing them increase in height from within outwards, and the tallest form a conspicuous line along the margin of the branch. The branches are for the most part broad and compressed, and inosculation takes place freely. A peculiarity which at once arrests attention is the large development of dorsal appendages for the purpose of attachment: these are short, cylindrical, calcareous processes, which are given off in great number from the under surface of the branches, and become firmly soldered to the body on which the polyzoon grows (Pl. IX. fig. 5a).

I have great pleasure in naming this form, which is a very characteristic member of the Polyzoan fauna of the Queen Charlotte Islands, after Dr. G. M. Dawson.

Tubulipora fasciculifera, n. sp. (Pl. IX. fig. 6.)

Zoarium flat, thin, closely adnate, flabellate. Zoecia free and erect above, depressed below, the free extremities disposed in short, disconnected, more or less divergent series, which range in radiate fashion (but somewhat irregularly) towards the margin, the series sometimes composed of a single line of connate tubes, sometimes of two lines placed side by side, sometimes of clusters (or fascicles) of tubes; orifice orbicular, unarmed; surface thickly speckled. *Gonocyst* an inflation of the zoarium, usually placed near the margin, involving a number of the zoecial tubes; surface covered with minute disks closely packed together.

On shell.

The fasciculate arrangement of the zoecia is the most distinctive character of the present species, but many single lines of cells mingle with the composite series. It grows in flabellate patches, which sometimes give off long linear or subclavate lobes. The free portion of the cell is much elevated and more than suberect.

So far as the character and arrangement of the zoecial series are concerned, the Cretaceous *Multifascigera Campicheana*, D'Orbigny, curiously resembles the present form (see Paléont. Franç. vol. v., Atlas, pl. 762. fig. 8).

DIASTOPORA (part.), Lamouroux.

Diastopora patina, Lamarck.

Cumshewa, on *Tubulipora* and *Myrizoum*.

[North and Arctic Seas, South Labrador, Britain, France (S.W.), Adriatic.]

Diastopora Sarniensis, Norman.

Off Cumshewa, 20 fms.

[English coasts (south-west and south-east), Mediterranean (probably).]

Diastopora suborbicularis (?), Hincks.[= *D. simplex*, Busk.]

On shell.

[Greenland, Finmark, Britain, Naples.]

A single specimen occurs, imperfectly developed, which seems to have the characters of this species. A larger portion of the cell is free than is usual in *D. suborbicularis*; but there is always much diversity in this respect, due to difference of habitat. The margin of the zoarium is slightly lobate, but this may be owing to the immature condition of the specimen.

Family *Lichenoporidae*.

LICHENOPORA, Defrance.

Lichenopora hispida, Fleming.

On shell.

[Norway, Finmark, Greenland, South Labrador, Britain, France (S.W.), Naples.]

Lichenopora verrucaria, Fabricius.Virago Sound, on *Sertularella*.

[Norway, Arctic Seas, Bay of Fundy, St. George's Banks, Britain (North and West).]

Suborder CTENOSTOMATA.

Family *Alcyonidiidae*.

ALCYONIDIUM, Lamouroux.

Alcyonidium gelatinosum, Linnæus.

Virago Sound.

[North and Arctic Seas, North America, Britain, Natal.]

Family *Vesiculariidae*.

BOWERBANKIA, Farre.

A member of this genus occurs on Sertularians from Virago

Sound, which is probably referable to *B. imbricata*, Adams, form *densa*, Farre.

[White Sea, Caspian Sea, Britain.]

Family *Buskiidæ*.

BUSKIA, Alder.

Buskia nitens, Alder.

Virago Sound, on a Sertularian ; also creeping over *Cellaria*.
[Davis Straits, White Sea, Barents Sea, Britain.]

Family *Cylindrocœciidæ*.

CYLINDROCÆCIUM, Hincks.

Cylindrocœcium giganteum, Busk.

In the specimens which I refer to this species, the cell is of more slender habit than in British examples and the ectocyst less opaque ; but these differences are of slight moment, and I have little doubt that the Pacific form is specifically identical with our own.

[Britain.]

[Group ENTOPROCTA.]

Order PEDICELLINEA.

Family *Pedicellinidæ*.

PEDICELLINA, Sars.

Pedicellina gracilis, Sars.

Virago Sound.

[Norway, Spitzbergen, White Sea, Britain.]

APPENDIX.

Family *Cellulariidæ*.

Menipea ternata, Ellis & Solander.

The form occurs in which the two lower cells in the triplet are much elongated and attenuated, and the habit in consequence is much more slender and graceful than in the normal condition. Smitt has recorded this variety from the north.

Menipea compacta, n. sp., form *triplex*.
(Pl. IX. fig. 8.)

[Described on page 3 of the Report.]

Only a small and imperfectly developed example of this species occurs amongst Dr. Dawson's dredgings; but very fine specimens from California (where it seems to be extremely abundant) and Vancouver Island enable me to correct my description of it in one or two particulars.

I find that on the same colony internodes composed of three cells are mingled with others bearing five or six, so that it is incorrect to designate the triple condition as a distinct form. We have a similar variation in *Menipea ternata*. The operculum is not "acicular," as described, in its fully developed state, though always very moderate in size. It is usually, in its perfect condition, clavate, expanding slightly above.

M. compacta grows in luxuriant bushy tufts, which bristle with spines.

Family Cellariidæ.

Cellaria mandibulata, n. sp. (Pl. IX. fig. 7.)

[See page 6.]

The figures represent the avicularium, which exhibits probably the least specialized form of the appendage in the Cellarian series, and a shoot of the natural size, in which there is a curious departure from the usual dichotomous ramification. The branches are given off from the stem at intervals on each side, instead of forming a fork at the joints. This peculiarity, however, does not appear to be characteristic of the species.

Family Membraniporidæ.

Membranipora velata, Hincks.

This Californian species occurs on shells dredged off Cumshewa; but the specimens from the Queen Charlotte Islands are destitute of the large avicularia. (See 'Annals' for August 1881, p. 130.)

Membranipora acifera, MacGillivray, form *multispinata*.

[See page 8.]

In a previous portion of this Report I have referred a *Membranipora* from the Queen Charlotte Islands to the *M. acifera* of MacGillivray*, of which it seemed to me to be a

* Described and figured in a paper read before the Royal Society of Victoria, December 9, 1881.

variety. But in a paper read before the Royal Society of Victoria, October 12, 1882, MacGillivray states that further examination has led him to identify this species with his *Membranipora serrata*, which is certainly quite distinct from the North-Pacific form. I shall therefore characterize the latter as

Membranipora pallida, n. sp.

Zoæcia elongate-oval, front wall wholly membranous, quincuncially disposed, margin thin, smooth, usually slightly elevated at the top; an erect spine on each side above and from six to eight slender pointed spines down each side, which incline inward; generally at the bottom of the cell, on a small quadrate area, an *avicularium* with an expanded base (occupying the area) and a very long, slender, tapering beak, which stretches upward along the margin; mandible triangular below, above setiform. *Oæcium* (?).

Zoarium whitish, texture delicate.

Virago Sound; spreading luxuriantly over shell.

Membranipora exilis, n. sp.

[See page 9.]

On further examination of this species I find that it agrees with *M. radiciæ* 1, Hincks, in being attached (in some cases at least) by radical tubes given off from the dorsal surface. It is not closely adnate to the surface on which it grows, as most of the *Membraniporæ* are, but is furnished with special organs of attachment. The first specimen which came under my notice (and on which my description was based) is growing on *Cellaria borealis*, the stem of which it loosely invests; in this case I have not been able to detect any of the dorsal appendages. But on a colony which spreads over a *Tubulipora* they are present in great numbers, and there can be no doubt that it is anchored by the radical tubes and not adhesive. In both cases the dorsal surface of the cells is convex and rounded, and clearly unfitted for direct attachment. Probably the presence or otherwise of the appendages is dependent on the nature of the habitat.

I have already ('Annals' for July 1881, p. 5, under *Membranipora radiciæ*) drawn attention to certain links connecting the Membraniporidan series with such forms as *Bugula* and *Diachoris*. We have another such link in the present species. A *Membranipora* which, from the nature of its habitat, had ceased to be adherent and had developed radical fibres as a means of attachment, would have made a very decided advance towards the Bugulan type.

Family Porinidæ.

Lagenipora spinulosa, n. sp.

[See page 31.]

When I first described this species I had only met with small incrusting colonies, and was under the impression that they represented the mature and perfect form. I now find, however, that this is by no means the case. When fully grown the zoarium of *Lagenipora spinulosa* is erect and ramose (Pl. IX. fig. 4), consisting of a cylindrical stem, which divides and subdivides dichotomously, the branches terminating above in short bifid segments. The zoecia are arranged longitudinally in six lines along the stem and branches, those in neighbouring lines alternating; the oral (or neck-like) portion free and projecting, the lower immersed. The surface of the cell is covered with very large foramina, which are closed in by membrane. Primary orifice elliptical, slightly narrowed below. The surface of the oecium is smooth, and entire behind; a raised line arches across it towards the front, and the portion in advance of this line is covered with minute disks closely packed together.

In its perfect condition this species bears a close resemblance, so far as habit and general appearance are concerned, to an *Entalophora*.

The wall of the cell is built up of tubes placed longitudinally and closely appressed to one another; this curious structure may be best observed in the erect neck-like portion of the zoecium. The superficial foramina are probably the openings of the tubes.

The lateral avicularia are supported on a tubular structure, which may be traced stretching down the inner wall of the oral cylinder (neck) and tapering off finely below. *Lagenipora spinulosa* would seem to be abundant where it occurs; it must be accounted one of the most interesting forms which Dr. Dawson's dredgings have yielded.

Family Myrizoidæ (part.).

Schizoporella cruenta, Norman.

This species must be added to the list of North-Pacific forms. The single specimen which occurs is in fine condition, and has the oral sinus much more strongly marked than the British examples which I have examined. The deep-red colour of the zoarium when fresh has given place to a uniform black.

[Nova Zembla, Greenland, Britain, from Shetland to the Channel Islands.]

Schizoporella biaperta, Michelin.

A specimen has occurred in which the oral avicularia assume both the round and spatulate form, as is commonly the case in the allied *Schizoporella armata*, mihi.

Schizoporella Dawsoni.

[See page 20.]

The species described under the above name I have now no doubt is identical with *Escharina torquata* of D'Orbigny ('Voyage dans l'Amérique méridionale,' tome v. 4^e partie, p. 11, = *Flustra torquata*, Lamouroux). *Schizoporella torquata* must therefore take the place of *S. Dawsoni* in the Report. I have, however, much pleasure in dedicating a fine species of *Tubulipora* (which I trust will prove to be undescribed) to the able investigator to whom we are indebted for our knowledge of the marine fauna of the Queen Charlotte Islands.

Schizoporella torquata (D'Orbigny), Lamx.
(Pl. IX. fig. 2.)

Virago Sound, on shell.

[Bay of Rio, on dead shells.]

Schizoporella linearis, Hassall, form *inarmata*.

The only specimens amongst the dredgings which are referable to this species are totally destitute of avicularia. In other respects they agree with the typical form, and must be regarded as an unarmed variety.

[Scandinavia, South Labrador, Mediterranean, Britain, France (S.W.).]

Family *Escharidæ* (part.), Smitt.*Lepralia cleidostoma*, Smitt, var.

A variety of this species occurs which is destitute of avicularia. There is frequently a small knob on each side of the orifice, and always a stout mucro immediately below it. The oecia do not exhibit the striæ which Smitt describes, but are smooth and polished. The only specimen, however, which I have examined is strongly calcified and has a highly varnished surface, and in this condition the striæ may be obliterated. An Australian variety has already been described with circular instead of pointed avicularia ('Annals' for August 1881, p. 122).

? *Porella argentea*, n. sp. (Pl. IX. fig. 1.)

Zoecia ovate, quincuncial, rather depressed (sutures shallow), surrounded by raised lines, surface thickly covered with punctures; orifice expanded above and well arched, contracted below; peristome slightly raised, especially above, a very prominent hinge-denticle on each side a little above the lower margin; immediately below it an umbonate swelling, bearing on its inner aspect an *avicularium*, with rounded mandible, directed upwards. *Oæcium* rounded, not prominent, surface somewhat roughened, usually a circular pore on the front. *Zoarium* white and silvery.

Houston-Stewart Channel, on shell.

Mucronella spinosissima, Hincks.

On further examination I find that in the younger cells there are two or three lines of pores forming a belt round the margin; and it seems probable that the curious tubular system which I have described (see page 27 of the Report) owes its origin to these. At least I can only explain it by supposing that, as calcification proceeds, it is arrested by the pores, and extends around them but not over them; so that they continue open, and form at last tubular shafts piercing the stony crust which has been piled up about them.

Retepora Wallichiana, Hincks.

This species has been obtained in Vancouver Island.

General Remarks.

The number of species recorded in the present Report from the Queen Charlotte Islands is 96, of which 36 appear to have been hitherto undescribed. Of the 60 species known to science more than a third (24 at least) seem to be distinctively Arctic forms, and of these 17 occur in the British seas*. Migration has taken place on the side of Davis Straits and Behring Straits: on the one the circumpolar species have distributed themselves along the North-American coasts and more or less widely along those of the British Islands; on the other they have colonized the nearer portions at least of the North Pacific. In the comparatively warm waters which

* The seven Arctic species which occur in the Queen Charlotte Islands but not in Britain are *Cellaria borealis*, *Flustra membranaceo-truncata*, *Membranipora S phia*, *Smittia plicata*, *Retepora Wallichiana*, *Cellepora incassata*, and *Myriozeugma coarctatum*. The whole number of species common to the Islands and Britain is forty-three.

bathe the shores of the Queen Charlotte Islands they evidently find a congenial home and are finely developed. There is nothing to show that they are unfavourably affected by the change of climate. Of these northern forms only one seems to reach the Mediterranean ; a few are widely distributed in the British seas, while the rest are pretty much confined to Shetland and the north-east and north-west coasts. In Prof. Verrill's 'Check-List of the Marine Invertebrata of the Atlantic coast, from Cape Cod to the Gulf of St. Lawrence' (1879) thirty-one species are included which occur in the Queen Charlotte Islands, and of these nineteen are Arctic ; so that the results of the northern migration have been much the same on both sides of the continent.

The remaining species obtained by Dr. Dawson constitute a somewhat miscellaneous company. They include a small group of cosmopolitan forms which occur in almost all latitudes, and are expected, as a matter of course, to be present wherever Polyzoa are found. Such are *Microporella ciliata* (perhaps the most widely distributed species in the class), *Schizoporella hyalina* (which almost equals it in this respect), *Smittia trispinosa*, and perhaps *Hippothoa distans*. A few species occur which have been found as far up the Pacific coast of America as California and Vancouver Island, but which are not known as Arctic forms. These are no doubt southern species which have travelled so far northwards. Indeed the Queen Charlotte Islands are, in a remarkable degree, the meeting-ground of northern and southern forms. *Membranipora Rosseli*, *M. tenuirostris*, *Cribrilina radiata*, *Schizoporella Cesilii*, *S. sanguinea*, *S. torquata*, and *Diastopora suborbicularis* are essentially southern.

Seventeen species are common to the Islands and Australia, and of these thirteen are also European : nine of them occur in the Arctic seas. Two have only been found, so far, in Australia and the Queen Charlotte Islands (*Porella marsupium* and *Mucronella spinosissima*). *Lepralia cleidostoma* has occurred in these two localities and off the coast of Florida.

It may be noted here that of the whole number of Queen Charlotte Islands species only nine are not also European.

Some of the ascertained facts respecting the distribution of the Polyzoa are sufficiently perplexing, and we must wait for a larger accumulation of data before we may hope to explain them satisfactorily. The way in which certain species are strewn, as it were, at haphazard over the surface of the globe is a difficulty of which the solution is not apparent. We must, I think (as I have suggested before), make large allowance for the agency of man, and of currents, floating weed and

timber, &c., in the diffusion of the species, apart from the general laws which preside over the distribution of life.

Further light will no doubt be thrown on the relations of the Polyzoan fauna of the Islands when we know more of the history of the group of new forms recorded in this Report. We may venture, I think, to say, that they are not to any large extent Arctic. Are they southern coast-line emigrants, or do they occupy their original home?

EXPLANATION OF PLATE IX.

Fig. 1. *Porella argentea*, n. sp.

Fig. 2. *Schizoporella torquata* (D'Orbigny), Lamx.

Fig. 3. *Cellepora*? n. sp. (*brunnea*); a cluster of zoecia, showing one of the marginal decumbent cells.

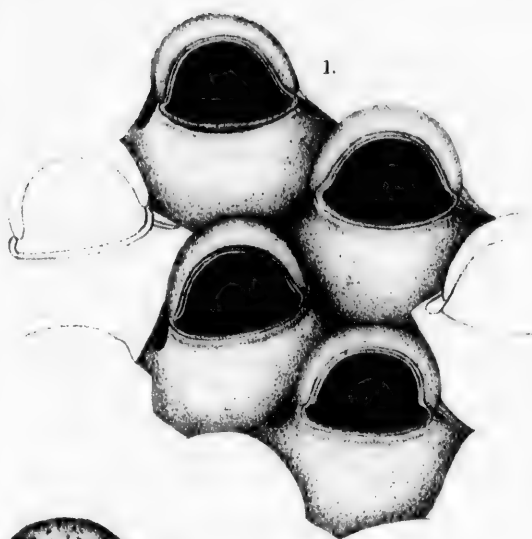
Fig. 4. *Lagenipora spinulosa*, n. sp.; erect form, nat. size.

Fig. 5. *Tubulipora Dawsoni*, n. sp., nat. size. 5 a. Portions of the stem showing the offsets from the dorsal surface, by which the zoarium is attached. 5 b. Portion of a branch, showing the disposition of the zoecia. 5 c. The extremity of a branch, showing the cellular capitulum and several of the scattered central zoecia.

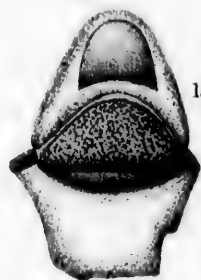
Fig. 6. *Tubulipora fasciculifera*, n. sp.; portion of the zoarium, showing the arrangement of the zoecia. 6 a. A colony, nat. size.

Fig. 7. *Cellaria mandibulata*, n. sp.; avicularian cell. 7 a. Nat. size, showing a peculiarity in the ramification.

Fig. 8. *Menipea compacta*, n. sp.; front view of an internode. 8 a. Dorsal surface.



1.



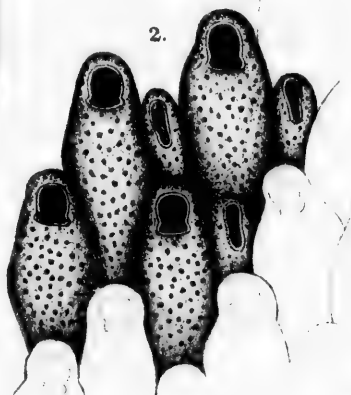
1a.



1b.



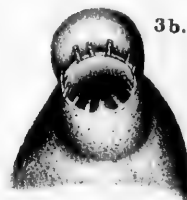
2a.



2.



3a.



3b.



4.



3.

